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ABSTRACT

Agri Tech Prep 2000 (ATP 2000) is a 4-year tech prep program linking high school and postsecondary curricula designed to prepare New York students for careers in agriculture or acceptance into a college program in agriculture. Because teacher development was designated an integral project component for fiscal year 1991-1992, a weeklong teacher development program was conducted in cooperation with the State University of New York in summer 1992. The primary focus of the inservice program was on the first phase of ATP 2000, and its primary objectives were as follows: demonstrate instructional materials and methods of instruction, foster discussion about issues related to secondary-postsecondary articulation of agricultural instruction, and establish professional dialogue between agriculture and academic core teachers and between teachers and project administrators. Eleven schools sent one or more representatives to the inservice program. Participants also received laboratory teaching kits/instructional materials, lesson plans, materials on compliance and arrangement for ATP 2000, and evaluation instruments. Project feedback obtained from written questionnaires and discussions was quite favorable. (Appendixes constituting two-thirds of the document include the inservice and course program, course materials, presenter evaluations, the inservice evaluation form and summarized findings, and the Strong Interest Inventory evaluation.) (MN)

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agri tech prep 2000

Teacher Development Program for ATP 2000 Project Report

ED 366 782

Partial Fulfillment of Cornell Subcontract
NYS Project 137305
in Conjunction with
ATP 2000

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July 27-31, 1992

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Preface

The teacher development program summarized in this report was a joint effort of the ATP consortium members and cooperators. Many individuals contributed to the success of this phase of the project. Members of the Cornell subcontract staff include Diane Jobe who assisted primarily with coordinating summer session activities and Mhora Newsom–Stewart who assisted with registration, evaluation of the program, and the writing of this report.

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Introduction

Teacher development, an integral component of the ATP 2000 Project for fiscal year 1991–91, was part of the Cornell subcontract. This report summarizes the major events and activities associated with the teacher development phase. In addition, related activities of the primary project sponsor, members of the consortium and project cooperators are indicative of the team effort given to this project.

Needs Addressed by Project

Several needs apparent in agricultural education in New York State were addressed in this phase of the project.

Fragmentation and duplication of curriculum is a current problem. In this project teachers will incrementally integrate new curriculum in their programs. Teacher inservice is a prerequisite to improving a curricula continuum between high school agricultural education and New York State two year colleges of agriculture and technology.

The agricultural industry is rapidly expanding. Teachers need inservice education on new curricula and teaching strategies to address the new areas.

Declining enrollment in agricultural instructional areas is leaving a shortage of properly educated personnel for agricultural industry. Innovative instruction and contemporary curriculum will help address this problem, attracting students from a wide range of ability levels to meet employment demand in the broad agricultural industry. In addition, program options for entry, exit and re-entry in a continuum of instruction will match students' needs and interests.

Science, mathematics, communications and technology are essential components of agricultural instruction and are prerequisite skills for employment in the industry. However, many students aren't motivated by traditional instruction in these areas. Additionally, these academic instructional areas aren't as prominent as they should be in traditional agricultural instruction at the secondary level. Infusing academic instruction in agricultural programs provides a familiar context to study that is intrinsically motivating to many students. This approach will help address the problem of adequate preparation of high school students for higher education. Teacher inservice exposes teachers to various techniques which will enable them to incorporate traditional academic areas into their agricultural instructional programs.

Misconceptions about agriculture, agricultural education and related career opportunities are problems rarely addressed in public education.

Instructional materials presented in this inservice program include information on a wide range of career options in agriculture. These materials will create an awareness of the field of agriculture and related careers.

Teacher Development Objective

One component of the ATP project is teacher inservice education. The purpose of this phase is to facilitate implementation of a state-wide, comprehensive and articulated four year agricultural education curricula, encompassing the last two years of high school and the two years of postsecondary education, with options for qualified students to continue in higher education.

Specifically, this teacher development initiative is one of three objectives specified in the Cornell subcontract.

> Facilitate the implementation of new curriculum by planning and implementing a five day teacher development program for pilot school staff during Summer 1992.

Activities and Events

A summer teacher development program was planned and conducted in cooperation with SUNY Alfred, Cobleskill and Morrisville. Instruction focused on classroom pedagogy, agricultural concepts, technologies and laboratory methods, core curriculum topics and agricultural careers. Plans for the first in a series of teacher development activities were initiated during Spring 1992. Although the week long summer professional update was July 27- 31, much of the planning and development were within this contract year which ended June 30, 1992.

The thrust of the inservice was preparation to teach selected components of the first phase of ATP. Facilitating an exchange of information between core academic subject matter teachers and agriculture teachers is integral to this mission. Informational and instructional events were developed during Spring and Summer 1992 to encourage interdisciplinary communications.

SUNY Morrisville, the most centrally located of the three postsecondary programs, hosted the inservice. Wayne Gillis, Dean of the College of Agriculture and Technology, and Jim Van Riper, ATP Summer Session host institution site coordinator gave administrative leadership for local arrangements. Faculty and administrators from SUNY Alfred and Cobleskill were equal partners in planning and conducting the summer program. However, most of the inservice in agriculture was provided by faculty at SUNY Morrisville because writing teams for the instructional activities for the first phase of the project (Year 1) were Morrisville faculty.

Planning and development activities for the summer inservice were part of the entire project activities, not an isolate event linked to this subcontract. Key players were the ATP steering committee, SUNY Agriculture and Technical College faculty, administrators and the teaching staff in the secondary pilot schools, the Instructional Material Service at Cornell and the principal investigator for this subcontract.

Inservice objectives

The inservice objectives for the ATP Project in 1991–92 were:

- demonstrate instructional materials and methods of instruction.
- model teaching events.
- foster discussion about issues related to secondary to postsecondary articulation of agricultural instruction.
- improve communications and establish professional dialogue between agriculture and academic core teachers.

Planning

The planning activities for the summer inservice included:

- Review initial summer session plans with ATP steering committee, January 1992.
- Select topics for curriculum and instructional materials development, March 1992.
- Select SUNY Morrisville as the summer session site and identify a site coordinator, March 1992.
- Identify writers for each instructional topic who were to make presentations at the summer inservice program, April 1992.
- Purchase instructional materials and develop curriculum, April through June 1992.
- Make local arrangements, develop the summer program and register participants, May through June 1992.
- Deliver and evaluate the program, July 1992.

Throughout this process there was a close working relationship between the coordination of teacher inservice and the development of instructional material through the Cornell Instructional Materials service. Unfortunately, there was not enough time for a full review of the Summer inservice curriculum materials by agriculture and academic teachers or industry representatives. This review will occur during the revision process Fall 1992.

Instructional topics

Topics for the summer inservice were selected by the project steering committee. These are the areas targeted for the first phase of curriculum implementation. Each topic is described in the summer session program (Appendix A). The focus areas were:

- Linking secondary and post secondary instruction in agriculture
- Recovery and recycling
- Environmental management
- Aquatic ecology and water pollution
- Integrated pest management
- Implementing hands–on science
- Future plans and development for ATP
- Compliance, regulations and arrangements related to ATP

Participants

Teachers directly responsible for ATP program implementation attended the summer inservice program. Academic core subject matter teachers were also encouraged to attend. Administrative representative were specifically invited to the Friday session which focused on administration, guidance and counseling with respect to the program.

The pilot schools include:

Cuba–Rushford	Greenville
Fillmore	Friendship
John Bowne	Lowville
Madison–Oneida BOCES	Putnam Westchester BOCES
Pioneer	St. Johnsville
Vernon–Verona–Sherrill	Tri Valley

All schools with the exception of Madison–Oneida BOCES sent one or more staff members.

Products and Services

Summer inservice

Products and services provided to participants in the summer session program included:

- Laboratory teaching kits and materials for each topic to teach a class of 20 secondary school students. See Appendix B for a list of the material distributed.
- Lesson plans and related instructional materials assimilated in a three ring notebook, *Integrating New Technologies in Agricultural Education* (Available on request from Cornell Instructional Materials Center).

- Inservice instruction on the use of instructional and curriculum materials.
- Materials on compliance, regulations and arrangements for ATP 2000 from the State Education Department.
- Instrument to evaluate the summer program.

Each secondary school and BOCES received a set of materials (listed in Appendix B). In addition, a set was provided to each participating post secondary college and the Instructional Materials Service at Cornell University. Evaluation forms were included with each packet so that teachers could return comments on their review of the material.

Due to the Cornell linkage to teacher development, the week long activity also carried an option for credit from the Cornell College of Agriculture and Life Sciences, Department of Education, Summer Session Division. Learning contracts related to curriculum development were developed for those who registered for credit. As with most conferences, there were significant intangible benefits including the professional exchange that occurred between presenters and those in attendance.

Teacher updates

Updates were held during 1991-1992 at various meetings that agriculture teachers typically attend. Perhaps the most notable was the Annual New York State Agriculture Teachers' Conference held the last week of June. All the major players in the project gave a report.

Teachers were updated on ATP Project activities. Specifically, project developments during 1991–92 were shared by the coordinator. Also, a perspective on developments and ideas for the future were shared by members of the steering committee. Following this overview, the curriculum development specialist focused on new instructional materials and curriculum development activities. In addition, there was a brief report on project evaluation and research that will provide the background information for curriculum development and related activities.

Evaluation

Summer Inservice:

The summer inservice program was evaluated in three areas, the presenters, teacher reflections and week in review.

Evaluation of Presenters

First, participants evaluated each session immediately following half and full day presentations. Criteria for the evaluation included:

1. Extent to which the educational program contributed to the teacher's ability to use the printed materials.
2. Contribution to the teacher's ability to use the material.
3. Presentation.
4. Curriculum content.
5. Contribution to student learning.
6. Integration of multiple subject areas.
7. Interest level of the students in each lesson as perceived by the teachers.
8. Teacher's overall opinion of the instructional materials and presentation.
9. Appropriateness of content of material for use in the school.
10. Appropriateness of activities for use in the school.
11. Clarity of material

Appendix C includes evaluations of the four presentations. In general, the presentations were rated favorably. However, concerns were raised regarding the Aquatic Ecology and Water Pollution and Recovery and Recycling modules as being too technical and at too high a level for tenth grade students. Concerns were also noted regarding the accessibility of resources to teach the lessons. Evaluation results are shown in Figure 1.

Figure 1: Summary Program Evaluation Mean Score

Question	Subject EM n=18	AE n=16	RR n=17	IPM n=14
1. To what extent do you think the educational program contributes to your abilities to use the printed instructional materials?	4.2	3.5	3.6	4.9
2. How necessary is this program for your ability to use the instructional materials?	4.3	3.9	4.2	4.6
3. Please rate the instructional materials and presentation on each of the following characteristics by circling the number that best reflects your opinion.				
Presentation	4.5	3.5	3.9	5.0
Curriculum Content	4.8	4.1	4.1	4.9
Contribution to Student Learning	4.7	4.0	3.9	4.9
Integration of multiple Subject areas.	4.6	4.3	4.0	4.8
What interest level will the lessons generate among students?	4.4	4.1	3.5	4.5
Your overall opinion of the instructional materials/presentation.	4.7	3.9	3.9	4.9

Is the content of the material appropriate for use within your school?	4.7	3.5	3.8	4.8
Are the activities appropriate for use within your school setting?	4.7	3.6	3.8	4.8
Is the material clearly written?	4.6	3.7	3.8	5.0

WHERE:

EM=Environmental Management
AE=Aquatic Ecology and Water Pollution
RR=Recovery and Recycling
IPM=Integrated Pest Management

NOTE: The mean score was calculated using a scale from 1 to 5 . The lowest was ranked a 1 and the highest as 5.

COMMENTS:

Environmental Management:

I liked the practical appreciation, organization and suggested teaching strategies.

Excellent!

Aquatic Ecology and Water Pollution:

Content of material is appropriate if we can get a pond to work in.

Curriculum content is good for educating teachers, but content will need to be watered down for high school level.

Over emphasis on technical aspects.

Curriculum content is too high a level.

Activities, not lecture, contribute to student learning.

Materials are good, presentation is too technical.

Curriculum content has potential if properly developed.

Interest level of students will be high if schools can get the equipment.

Will be limited by facilities.

Recovery and Recycling:

I would like a small step by step model or presentation on what I could present to spark interest in subjects with a definite outcome or operating system.
More hands on would enhance presentation.

Curriculum content is too high a level content to be understood by high school students.

What interest level will the lessons generate? Depends on level of difficulty and how it is presented.

Material is clearly written, but I think it is a higher level content and needs to be more basic for high school students.

Integrated Pest Management:

Material is clearly written, excellent for adaptation to curriculum.

Best format to follow for all teachers.

Materials very clear and concise.

Teacher Reflections:

To provide additional feedback for curriculum development, a more extensive and reflective instrument was administered, *Summary and Reflections of ATP Teacher Development Program.*

The purpose of this reflective exercise was four fold. First, it provided feedback on current thinking of teachers–useful information to plan the content of subsequent teacher development programs. Second, the instrument gave the presenters feedback on how well they communicated with their audience. Third, the information will be useful to writing teams in that it provides feedback from the teachers and is an appropriate vehicle for presenting teachers concerns and ideas. This information will be used to revise the lessons before a final product is produced for the ATP curriculum. Fourth, the process engaged participants in a higher order level of cognitive reflection through a group process and led the participants to think more clearly about how they will implement the program in their school.

To evaluate the program the following major areas were included:

1. Description of the session.

2. Summary of instructional events and activities.

3. Anticipated student learning outcomes from high school implementation.
4. Opportunities for scientific investigation and problem solving.
5. Curriculum and instructional innovation.
6. Educating the whole person.
7. Integration skills including math, science, communication skills and technology.
8. Instructional facilities and materials.
9. Student careers including those appropriate for high school graduates and those appropriate for college graduates.
10. Related educational issues.
11. Implications for electronic and other technology.
12. Problems and concerns for Implementation in the school.

See Appendix D for the blank form, *Summary and Reflections on the ATP Development Program.*

Three teachers were assigned to "listen and reflect" on each of the presentations. Additionally, Diane Jobe, a staff employee, wrote a description for each of the presentations. Thus, each session had three or four persons specifically assigned as evaluators. As much as possible, each listening team met immediately following the presentations to complete the instrument and to compare their perceptions and exchange information. The next day, the listening team met with the whole group to gather feedback on the listening team's reflections and to add other reflections of the total group. Appendix E contains the results of the evaluation for each session.

The data are summarized in twelve (12) major areas. The following descriptions show the significance of each area.

Description of Session: An overview and major areas show the thrust of each session.

Summary of Instructional Events and Activities: A range of learning activities provide teachers with a choice of instructional strategies. Most of the instructional events have math, science, technology and communications skills infused within them.

Anticipated Student Learning Outcomes from High School Implementation: Teachers need clear ideas about the knowledge, skills and attitudes that students should learn ranging from task-related skills to life-skills. "Appreciation for maintaining a healthy environment" and learning that "forestry is math, science, hard work and dedication" are examples of general outcomes, lifetime skills and the knowledge base that this curriculum includes. Additionally, integrating concepts from a variety of disciplines and bridging the gap between school and 'real life' are important outcomes.

Opportunities for Scientific Investigation and Problem Solving: Activities were identified which could be used to develop problem solving skills. Opportunities noted were indicative of the integration of disciplines found in this curriculum. Examples include math calculations of tree density, board feet and estimation of cost.

Curriculum and Instructional Innovation: Instructional strategies such as cooperative learning, hands-on experiences, field trips and working with other organizations should link the school to the 'real world'. Additionally, strategies that build organization skills and career awareness were mentioned.

Educating the Whole Person: BOAC, other FFA activities, IPM programs and activities at local and state fairs help students develop career awareness and the ability to work together. Activities of this nature also link subject matter and the 'real world' in areas such as "Awareness of environmental, economic, social concerns," and "Awareness of self and communication with the family."

Integration Skills: In general, participants clearly perceive the integration of subject matter across the curriculum through instruction in agriculture.

> Math: Math is an integral part of agricultural instruction. There are a variety of specific examples and a perception among teachers that "Math can be fun" as well as a means of developing decision-making skills. There are opportunities for team teaching between agriculture and math.
>
> Science: Science related concepts are imbedded in agricultural instruction, both disciplinary knowledge and practical skills. Again, agricultural instruction is strongly linked to the 'real world'.
>
> Communication: Similarly, communication skills are integral to the ATP curriculum and essential for employment in the agriculture industry.
>
> Technology: There are opportunities to team teach with and about technology through the ATP curriculum.

Instructional Facilities and Materials: Teachers have some but not all of the materials needed to teach the ATP curriculum. The lack of facilities and materials presented "Good opportunities to work with local businesses, i.e. tree firms, farms and chemical companies." This reinforces the instructional link to the 'real world'. High motivation and enthusiasm for incorporating the sessions into their classes was apparent among the teachers.

Student Careers: There are employment opportunities for both high school and college level graduates of the ATP curriculum.

Related Educational Issues: Teachers are aware of the link between curriculum and societal and environmental issues. Examples included "Zebra mussels," "Legislation", "Food quality" and the Spotted Owl.

Implications for Electronic and other Educational Technologies: Distance learning, computers, CDROM and laser disks are examples of educational technologies needed to teach the ATP curriculum.

Problems and Concerns for Implementation in Participants School: The primary concerns are money and access to facilities. Additionally, the length of time to conduct the activities and the support of other teachers are concerns that should be addressed in further planning and in other inservice programs.

Week in Review:

To provide feedback for inservice development, an extensive instrument was administered which gathered information concerning the entire inservice week, *Summary Friday Program Evaluation*. The purpose of this exercise was four fold. First, it provided feedback concerning the presentations by participants conducted the last day of the session. Second, the instrument gave the Friday panel feedback on how well they communicated with the teachers and how well the teachers' understand the curriculum development/implementation process. Third, the information will be useful in that it provides feedback from the teachers and allows them to present concerns and ideas regarding the week as well as general comments. Fourth, feedback was gathered concerning the inservice format, workshop staff and accommodations and facilities which will be useful for future planning.

In general, teachers rated the entire inservice program very highly. Examples of comments include "I would like to thank the steering committee for all of the hard work and leadership that they have exhibited over the past year.", "Excellent program!" and "It was an excellent week and I am proud to be a part of the movement for directing the future of Agriculture education in our state."

The primary concerns raised were need for continuing inservice, less seat time and more hands on activities. Additionally, questions were raised as to the necessity of

the Friday morning presentations by the teachers. The evaluation summary is in Appendix G.

Strong Interest Inventory:

In addition to evaluating the summer program, the use of a student careeer interest survey was discussed. The Strong Interest Inventory Survey has potential merit in the ATP project. According to ATP summer session participants it is useful for individual student career assessment. Among the specific applications are initiation of a Career Orientation program, as an aid in career planning and post secondary choices, as a means of facilitating individual psychological counseling, as a way of informing parents how to better assist their children and as an aide to the business and professional community in building networks to the school. This Strong Interest Inventory form is in Appendix F.

Summary, Conclusions and Recommendations

Summary:

Teacher development activities during 1991–92 fulfilled the needs and objectives required of the Cornell subcontract and the related ATP Project.

Periodic updates of key leaders and participants in ATP 2000 were important to the inservice effort during the past year. These updates were part of planary meetings held twice at SUNY Alfred, Cobleskill and Morrisville; the Annual Meeting of the Association of Teachers of Agriculture in New York and other gathering of teachers. Members of the project steering committee, the project coordinator, members of the Cornell subcontract team and other representatives of ATP were effective spokespersons at these meetings.

Updates and reviews of project developed teaching materials and inservice activities are planned for 1992–93. The experiences and feedback from activities this year will be very helpful in planning future activities.

The major inservice effort was the week long program at SUNY Morrisville. Teacher development was the primary thrust, providing new curriculum, instructional materials and teacher training to begin implementation of the ATP project. In addition, one day of inservice focused on the administrative, counseling and related networking necessary to support implementation.

Integrating academics in agricultural education is an important component of ATP 2000. Worksheets, group discussions, listening teams and other reflective processes encourage teachers to examine how science, math, communications, technology and agriculture teachers can work together to improve teaching and learning. It will be important to strengthen efforts in this area as the project progresses.

Evaluations and reflections of the inservice were positive, indicating a need for continuing inservice programs in the future. Comments on presentations and curriculum materials will be useful to curriculum writers who are preparing teaching materials for ATP 2000. The major concerns that teachers have about implementing ATP 2000 are building teaching relationships with academic teachers, access to equipment and facilities, funding for long term support and time to teach the new curriculum.

Conclusions:

Based on evaluations, experiences and observations of the inservice component this year the following conclusions were drawn:

Context

1. The secondary and post secondary schools in the ATP program are providing a receptive environment for changing the school curriculum. The teacher and staff are cooperating, although one of the centers has attended fewer events than others.

2. Several of the secondary schools made special provisions to properly field test an evaluation instrument in late Spring 1992.

Input

3. The Cornell University Agricultural, Extension and Adult Education Unit and the Instructional Materials Service provided support service for project evaluation, reseach and development.

4. There was not adequate time in the 1991–92 project year to involve agriculture teachers, academic teachers, school administrators, industry representatives and others in developing curriculum materials to the extent envisioned in the original project proposal.

Process

5. Reactions and feedback from teachers during update and planning meetings provided the steering committee and members of the Cornell development team with information they needed to refine project initiatives. However, there was not enough time for a full review of curriculum materials prior to presenting them at the summer inservice.

6. Periodic meetings between ATP project leaders and participants contributed to effective communications and are invaluable to the development process.

7. Integrating math, science, communications and technology with agricultural education is an important component of ATP 2000. Although agriculture teachers are highly motivated to work with other teachers, they are somewhat uncertain on how to facilitate this new initiative in their schools.

8. Although the number of academic core teachers at the 1992 ATP inservice was limited, they added significant positive dynamics to discussions on integrating academic skill building events in agricultural education.

9. Only a limited number of academic teachers, school administrators and guidance counselors were attracted to the special session held at the ATP inservice program using the following methods:

    - Letter inviting attendance six weeks prior to session
    - Followup mailing three weeks prior to the event
    - Meals and lodging provided

10. A preregistration meals and lodging package was an efficient strategy to accommodate the needs of those attending the conference. It allowed the inservice leaders to devote their full time to instructional activities and the program.

Product

11. Inservice activities such as the one at SUNY Morrisville are essential for project implementation. Teachers need to develop new skills and understandings to teach new technologies and science associated with agriculture.

12. Characteristics that positively affected the 1991–92 inservice were:

    - Appoint a coordinator who works at the inservice site to assist with planning, development and implementation of the program
    - Involve the steering committee, coordinator, and campus coordinators in planning
    - Register persons in advance of workshops
    - Offer college credit and continuing education unit options
    - Provide instructional materials and lesson plans that are teacher friendly and ready for use in the classroom
    - Model teaching at a level directly transferable to the high school classroom
    - Emphasize hands-on learning activities
    - Use laboratory activities that can be emulated in schools and the school communities
    - Distribute practical and motivating laboratory science kits and provide instruction on their use

- Assimilate instructional materials for distribution at conference registration
- Each day, provide time for participants to:
  - interact
  - reflect on their experiences
  - share their perspectives
  - conduct a daily evaluation
- Use listening teams, evaluation instruments and other strategies to facilitate the reflective processes
- Include social events that develop good group dynamics and rapport
- Provide flexible time in the evening to tour instructional facilities on the college campus and for teachers to informally share their professional activities.

13. Results of the spring research that showed students' career interests and related information were interesting and useful to teachers in selected schools. Presentation of the information and an explanation of the process for interpreting the results was a positive component of the inservice program. It will help teachers and other school officials give career counseling to students and plan curriculum that meets their needs.

14. Problem solving, the scientific process, and critical thinking were considered by teachers as useful teaching strategies and were an important component of the summer inservice program. These strategies have not frequently been used formally by teachers.

15. Teacher mini-presentations which allowed them to practice what they learned during inservice were effective.

Recommendations:

The inservice experience this year leads to the following recommendations:

Context

1. Project participants and cooperators need a positive context for project development, facilitated by inservice updates where there is an open exchange of information, problems and concerns.

Input

2. Additional input on the development of teaching materials is needed from academic and agriculture teachers, along with school administrators, agricultural industry representatives and others.

Process

3. A procedure should be adopted for systematic review of instructional materials during the developmental phases. This most likely means expanding the writing teams to include other significant individuals.

4. Update and planning meetings should be planned and continued as an active component of the project.

5. The positive aspects of the model for developing inservice programs this year should be used next year.

6. Mini-presentations by teachers on the last day of an inservice program should be considered in the future. These serve as a time for teachers to practice presenting and promote interest in implementing the curriculum.

7. New strategies are needed to involve academic teachers in the project activities. This should improve as the project develops and there is more direct contact and building of rapport between project leaders and school officials. Other strategies are to develop directed activities that require consultation between teachers and build academic teacher presentations into inservice programs.

8. Similarly, strategies should be developed to involve administrators and guidance counselors in sessions that keep them informed, involved and supportive of the project. These activities should be very focused, of high quality and actively involve those who are attending.

9. A committee should be selected to assist in designing inservice education programs.

Product

10. Based on this year's experience with writing instructional materials, a model should be selected that is most user friendly and then used as a basis for developing other materials.

11. Science based laboratory kits sufficient for use in schools should be selected and distributed.

12. Teachers should be involved in review and refinement of instructional materials for inservice programs.

In general, the inservice program this year was a new experience. Time was short to develop the program. Even so, the experience was positive and supported by excellent evaluations. The challenge for the future is to make refinements, involve more people and build a continuum of instruction that facilitates project implementation.

The next scheduled event related to inservice is a meeting of project leaders to discuss the inservice and curriculum development programs. Selected teachers who attended the ATP 2000 summer inservice program will make presentations at the agriculture teachers' annual fall leadership conference. This will inform teachers across the state who are not directly involved with ATP 2000 and help to set the stage for statewide implementation.

APPENDIX A

INSERVICE AND COURSE PROGRAM

Integrating Science and Agriculture through Agri-Tech Prep 2000

(ATP 2000)

ATP Inservice and Summer Course
July 27-31, 1992

SUNY Morrisville
Morrisville, New York

Sponsoring Units

SUNY Colleges of Agriculture and Technology
Alfred, Cobleskill and Morrisville

Pilot School Districts:

Western	Central	Eastern
Cuba-Rushford	Vernon-Verona-Sherrill	Putnam Westchester Co
Pioneer Central	Madison-Oneida BOCES	Tri Valley Greenville
Friendship Central	St. Johnsville	John Bowne High School
Fillmore Central	Lowville	Greenville

Agriculture, Extension and Adult Education Program
Department of Education, College of Agriculture and
Life Sciences, Cornell University and Cornell Summer Session
NYS Rural Schools Program at Cornell

Summer Session Coordinators:
Jim Van Riper, SUNY Morrisville, Arrangements and Facilities
Alan Myers, ATP Coordinator, General
Dean Sutphin, Cornell University, Instructional Program
Dee Jobe, Cornell University, Project Assistant
Daryle Foster and Andy Fagan, Cornell University,
Instructional Materials

Host College and Contact Person:
SUNY Morrisville
Jim Van Riper tel. (315) 684-6240 or (315) 684-6083

NOTES

DAILY AGENDA

Monday, July 27, 1992

10:00 am - Noon: Linkages between High School and Post Secondary Education in the Transfer of Basic and Applied Sciences
Wayne Gillis, Dean of College of Agriculture and Technology, SUNY Morrisville
Daryle E. Foster, Director/Instructional Materials Service, Cornell University
Dean Sutphin, Associate Professor of Agricultural Education, Cornell University

This session includes registration, an overview of the week, a tour of Morrisville Agricultural and Technical facilities and a discussion of expected outcomes from the course. Discussion topics will include integrating new agri-science content in existing curricula, adapting new teaching strategies, material and laboratory equipment needs and the potential linkages between high school, post secondary, and other educational agencies.

Noon - 1:00 pm: Lunch

1:00 - 4:30 pm: Recovery and Recycling
Douglas Nelson, Associate Professor, Agricultural Engineering Technology, SUNY Morrisville.

Doug will provide student exercises and demonstrations dealing with waste and their treatment, disposal and reuse. He will present methods to teach such topics as landfill operation, recycling systems, wastewater treatment, and biosolids disposal. Emphasis will be on classroom, hands-on activities. Chemical, physical, mathematical and biological principals will be stressed.

Tuesday, July 28, 1992

8:30 am - Noon and 1:00 - 4:30 pm: Environmental Management
Barrett Gates, Professor of Natural Resources Technology
SUNY Morrisville

The morning session will include video tapes and lecture/discussion of the subject areas of Forest Management, Grassland Management, Wildlife Management and Environmental (Geologic) Hazards. The afternoon session will be in the field utilizing math principles to inventory forest and wildlife populations and illustrating numerous principles discussed in the morning session.

Wednesday, July 29, 1992

8:30am - Noon: and 1:00 - 4:30 pm: Aquatic Ecology and Water Pollution
John Foster, Professor of Fisheries and Wildlife, SUNY Cobleskill

This session emphasizes the "learn by doing" approach to teaching. Directed student learning activities focus on the study of small ecosystems, such as a stream or pond. Students will become familiar with the equipment, methods and technology appropriate to small scale aquatic ecology studies in New York. The laboratory session will emphasize applied hands-on field and laboratory experiences to illustrate ecological principles. Lesson plans for physical characterization and mapping, water quality analyses, and sampling plankton, benthos and fish will be demonstrated. While the goal of this session is to get insight into various ecological principles, other topics such as physical chemical properties of water, hydrologic cycle, water uses and water pollution will be integrated into the topic.

Thursday, July 30, 1992

8:30am - Noon and 1:00 - 4:30 pm: Integrated Pest Management
James Van Riper, Professor of Agricultural Sciences, SUNY Morrisville.

Integrated Pest Management is a decision making process utilizing multiple tactics to maintain pest populations at levels below those causing economic injury while providing protection against hazards to humans, domestic animals, plants and the environment. There will be discussions and demonstrations of techniques to teach pest identification, pest and environmental monitoring, economic injury levels, and pest control strategies that minimize the use of chemical pesticides.

Thursday Evening 6:00 pm: Dinner and Social
Car pool to Vernon Downs for dinner and an evening session involving the non-formal study of equine sciences and money management.

Friday, July 31, 1992

8:30 am - 2:30 pm: Week In Review and Updates

Dean Sutphin, Associate Professor, Agricultural Education, Cornell University.
Daryle Foster, Director/Instructional Materials Service, Cornell University

8:00-8:15	Orientation	
8:30-11:00	Hands-on Science	
11:00-12:00	Panel on Implementation in Local Schools and BOCES	
	Counselor	Melvin Dye, Cuba Central School
	Administrators	Otto Beehrens, Putnam BOCES
		Douglas Burton, Greenville
	Academic teacher	Claudia Kaufman, Friendship Central School
	Agriculture teacher	William Ransom, Greenville High School
12:00-1:00	Lunch	
1:00-1:30	Future Plans and Development by ATP Steering Committee James Thompson, SUNY Alfred MacDonald Holmes, SUNY Cobleskill Wayne Gillis, SUNY Morrisville	
1:30-2:15	Compliance, Regulations and Arrangements for Tech Prep Roy Dennison, SED Bureau of Occupational Education Larry Gray , SED Bureau of Post-secondary Education SED Science and Math Bureau Representatives	
2:15-2:30	Summary/Evaluation	

Your Week At SUNY Morrisville:
An Overview

Agri-Tech Prep 2000 project recognizes the importance of, and will directly contribute to the growth and development of the number one industry in New York State, Agriculture. In addition, it bridges the vocational and academic curriculums, creating a seamless education program for high school through two year college and beyond.

Goals of this inservice/course are to present new instructional modules for the ATP curriculum in targeted areas of agri-science.

Objectives are to:

1. **demonstrate instructional materials, methods and modules developed for the ATP Curriculum.**
2. **model teaching events for educators to implement in their classrooms.**
3. **foster discussion about issues related to secondary/post-secondary articulation for agricultural education.**
4. **to bring together secondary and post-secondary agriculture teachers, and core academic subject teachers to improve communication and cooperation among all educators.**

Instructional activities are primarily hands-on and problem centered laboratory exercises.

Materials provided to participants include lesson plans, handouts, laboratory kits, working models and other materials useful for teaching agriculture, science and new technologies.

APPENDIX B

COURSE MATERIALS DISTRIBUTED AT SUMMER 1992 INSERVICE

CHECK LIST:
Reference Materials for ATP Summer Course in Morrisville

1. Composting to Reduce the Waste Stream
2. On Farm Composting
3. Waste Management (fact sheets)
4. Disposal of Household Hazardous Waste (sheets)
5. Know Your Plant's Disease
6. CENET Handbook
7. Managing Small Woodlands for Wildlife
8. *Earth Revealed - Video
9. *Wildlife: An American Heritage - Video

* These videos will be sent or delivered to pilot schools after IMS receives the shipment.

CHECK LIST:
Reference Materials for ATP Summer Course in Morrisville

1. Composting to Reduce the Waste Stream
2. On Farm Composting
3. Waste Management (fact sheets)
4. Disposal of Household Hazardous Waste (sheets)
5. Know Your Plant's Disease
6. CENET Handbook
7. Managing Small Woodlands for Wildlife
8. *Earth Revealed - Video
9. *Wildlife: An American Heritage - Video

* These videos will be sent or delivered to pilot schools after IMS receives the shipment.

ATP 2000 Materials Check List 7/27/92

__ Basic Chromatography Kit (#36-5540) - ATP052
__ Population Concepts (#74-1674) - ATP058
__ The Continuing Forest - Video ATP027
__ American Agriculture a Need to Know - ATP035
__ Plant Growth Experiment Kit (#20-7700) - ATP048
__ Introduction to Agricultural Engineering - ATP023
__ Agricultural Biotechnology at a Crossroads - ATP015
__ What is Groundwater & Contamination - ATP069
__ Fish Management in New York Ponds - A802
__ Cornell Field Crops and Soils Handbook - G921
__ The Genetic Code: Video (#193-6453) - ATP059
__ DNA: Replication and Mitosis: Video - ATP060
__ Methods in Plant Tissue and Culture (#32-2194)-ATP055
__ Bio-Cell (#74-0112) - ATP057
__ En. Effects of Air Pollution (#36-5515) - ATP044
__ Greenhouse Box
__ Disposal of Household Hazardous Waste - ATP063 ($1.00)
__ Preparing Young Entrepreneurs - E403TP
__ The Young Entrepreneur; A Student Workbook - E402SW
__ Agricultural Education Science Activities - G600
__ Livestock Nutrition and Feeding - A5
__ Livestock and Poultry Breeding - A19
__ Introduction to Small Mammals - A911TP
__ Keeping the Cornell Farm Account Book; Student - E113
__ Keeping the Cornell Farm Account Book; Teacher - E114
__ Plant Mineral Deficiency Kit (#20-8400) - ATP049
__ Plant Genetics I: Crop Origins & Improvement(AU8001) - P14
__ Plant Genetics II: Plant Life Cycles... (AU8002) - P15
__ Plant Genetics III: Plant Repro. & Heredity (AU8003) - ATP003
__ IPM I, Ecology, Crops, Pests (AU8004) - ATP004
__ IPM II, Why IPM? (AU8005) - ATP005
__ Crop Breeding: Tomato (AU8010) - ATP006
__ Crop Breeding: Corn (AU8011) - ATP007
__ IPM, slide set(S1113) - ATP009
__ An Intro. to Livestock Waste Management, slides (S1109) - ATP002

APPENDIX C

EVALUATION OF PRESENTERS

Integrating Science and Agriculture Through Agri-Tech Prep 2000

ENVIRONMENTAL MANAGEMENT

Summary Program Evaluation
(Percent Responses)
n=18

Question	Scale					
	not at all	little	some	very	extremely	x
1. To what extent do you think the educational program contributes to your abilities to use the printed instructional materials?	0	0	16	50	33	4.2
	not at all	little	some	very	extremely	x
2. How necessary is this program for your ability to use the instructional materials?	0	0	16	39	44	4.3
3. Please rate the instructional materials and presentation on each of the following characteristics by circling the number that best reflects your opinion.						
	very poor	poor	average	good	very good	x
Presentation	0	0	6	39	56	4.5
	very poor	poor	average	good	very good	x
Curriculum Content	0	0	0	22	78	4.8
	not at all	little	some	very	extremely	x
Contribution to Student Learning	0	0	6	22	72	4.7
	very poor	poor	average	good	very good	x
Integration of multiple Subject areas.	0	0	0	39	61	4.6
	none	little	some	high	very high	x
What interest level will the lessons generate among students?	0	0	0	61	39	4.4

	very poor	poor	average	good	very good	$\bar{x}$
Your overall opinion of the instructional materials/presentation.	0	0	6	22	72	4.7
	not at all	little	some	very	extremely	$\bar{x}$
Is the content of the material appropriate for use within your school?	0	0	0	33	67	4.7
	not at all	little	some	very	extremely	$\bar{x}$
Are the activities appropriate for use within your school setting?	0	0	0	33	67	4.7
	not at all	little	some	very	extremely	$\bar{x}$
Is the material clearly written?	0	0	0	39	61	4.6

NOTE: The mean score was calculated on a scale from 1 to 5; lowest=1, (most far left), highest=5.

COMMENTS:

I liked the practical appreciation, organization and suggested teaching strategies.

Excellent!

Integrating Science and Agriculture Through Agri-Tech Prep 2000

AQUATIC ECOLOGY AND WATER POLLUTION

Summary Program Evaluation
(Percent Responses)
n=16

Question	Scale					
	not at all	little	some	very	extremely	*x*
1. To what extent do you think the educational program contributes to your abilities to use the printed instructional materials?	0	6	44	31	18	3.5
	not at all	little	some	very	extremely	*x*
2. How necessary is this program for your ability to use the instructional materials?	0	0	38	31	31	3.9
3. Please rate the instructional materials and presentation on each of the following characteristics by circling the number that best reflects your opinion.						
	very poor	poor	average	good	very good	*x*
Presentation	0	13	44	25	18	3.5
	very poor	poor	average	good	very good	*x*
Curriculum Content	0	0	18	50	31	4.1
	not at all	little	some	very	extremely	*x*
Contribution to Student Learning	0	0	18	63	18	4
	very poor	poor	average	good	very good	*x*
Integration of multiple Subject areas.	0	0	6	56	38	4.3
	none	little	some	high	very high	*x*
What interest level will the lessons generate among students?	0	0	13	63	25	4.1

	very poor	poor	average	good	very good	x
Your overall opinion of the instructional materials/presentation.	0	0	38	38	25	3.9
	not at all	little	some	very	extremely	x
Is the content of the material appropriate for use within your school?	0	0	63	25	13	3.5
	not at all	little	some	very	extremely	x
Are the activities appropriate for use within your school setting?	0	0	63	18	18	3.6
	not at all	little	some	very	extremely	x
Is the material clearly written?	0	13	27	40	20	3.7

NOTE: The mean score was calculated on a scale from 1 to 5; lowest=1, (most far left), highest=5.

COMMENTS:

Content of material is appropriate if we can get a pond to work in.

Curriculum content is good for educating teachers, but content will need to be watered down for high school level.

Over emphasis on technical aspects.

Curriculum content is too high a level.

Activities, not lecture, contribute to student learning.

Materials are good, presentation is too technical.

Curriculum content has potential if properly developed.

Interest level of students will be high if schools can get the equipment.

Will be limited by facilities.

Integrating Science and Agriculture Through Agri-Tech Prep 2000

RECOVERY AND RECYCLING

Summary Program Evaluation
(Percent Responses)
n=17

Question	Scale					
	not at all	little	some	very	extremely	x
1. To what extent do you think the educational program contributes to your abilities to use the printed instructional materials?	0	0	41	53	6	3.6
	not at all	little	some	very	extremely	x
2. How necessary is this program for your ability to use the instructional materials?	0	0	29	24	47	4.2
3. Please rate the instructional materials and presentation on each of the following characteristics by circling the number that best reflects your opinion.						
	very poor	poor	average	good	very good	x
Presentation	0	6	24	47	24	3.9
	very poor	poor	average	good	very good	x
Curriculum Content	0	0	29	65	12	4.1
	not at all	little	some	very	extremely	x
Contribution to Student Learning	0	6	24	47	24	3.9
	very poor	poor	average	good	very good	x
Integration of multiple Subject areas.	0	0	29	41	29	4.0
	none	little	some	high	very high	x
What interest level will the lessons generate among students?	0	6	47	35	12	3.5

	very poor	poor	average	good	very good	$\bar{x}$
Your overall opinion of the instructional materials/presentation	0	6	12	41	41	3.9
	not at all	little	some	very	extremely	$\bar{x}$
Is the content of the material appropriate for use within your school?	0	6	29	41	24	3.8
	not at all	little	some	very	extremely	$\bar{x}$
Are the activities appropriate for use within your school setting?	0	0	41	35	24	3.8
	not at all	little	some	very	extremely	$\bar{x}$
Is the material clearly written?	0	12	6	18	6	3.8

NOTE: The mean score was calculated on a scale from 1 to 5; lowest=1, (most far left), highest=5.

COMMENTS:

I would like a small step by step model or presentation on what I could present to spark interest in subjects with a definite outcome or operating system.

More hands on would enhance presentation.

Curiculum content is too high a level content to be understood by high school students.

What interest level will the lessons generate? Depends on level of difficulty and how it is presented.

Material is clearly written, but I think it is a higher level content and needs to be more basic for high school students.

Integrating Science and Agriculture Through Agri-Tech Prep 2000

INTEGRATED PEST MANAGEMENT

Summary Program Evaluation
(Percent Responses)
n=14

Question	Scale					
	not at all	little	some	very	extremely	x
1. To what extent do you think the educational program contributes to your abilities to use the printed instructional materials?	0	0	0	14	85	4.9
	not at all	little	some	very	extremely	x
2. How necessary is this program for your ability to use the instructional materials?	0	0	0	36	29	4.6
3. Please rate the instructional materials and presentation on each of the following characteristics by circling the number that best reflects your opinion.						
	very poor	poor	average	good	very good	x
Presentation	0	0	0	0	100	5
	very poor	poor	average	good	very good	x
Curriculum Content	0	0	0	7	93	4.9
	not at all	little	some	very	extremely	x
Contribution to Student Learning	0	0	0	14	85	4.9
	very poor	poor	average	good	very good	x
Integration of multiple Subject areas.	0	0	0	21	79	4.8
	none	little	some	high	very high	x
What interest level will the lessons generate among students?	0	0	7	36	57	4.5

	very poor	poor	average	good	very good	$\bar{x}$
Your overall opinion of the instructional materials/presentation.	0	0	0	7	93	4.9
	not at all	little	some	very	extremely	$\bar{x}$
Is the content of the material appropriate for use within your school?	0	0	7	7	85	4.8
	not at all	little	some	very	extremely	$\bar{x}$
Are the activities appropriate for use within your school setting?	0	0	7	7	85	4.8
	not at all	little	some	very	extremely	$\bar{x}$
Is the material clearly written?	0	0	0	0	100	5

NOTE: The mean score was calculated on a scale from 1 to 5; lowest=1, (most far left), highest=5.

COMMENTS:

Material is clearly written, excellent for adaption to curriculum.

Best format to follow for all teachers.

Materials very clear and concise.

APPENDIX D

SUMMARY AND REFLECTIONS OF ATP TEACHER DEVELOPMENT PROGRAM EVALUATION FORM

Implications for Curriculum Implementation
Agri Tech 2000

Topic_____

Rapporteurs
Name _____
School _____

Description of Session:
(overview and major areas addressed)

Summary of Instructional Events and Activities:
(learning activities – group and individual)

Implications for Curriculum Implementation
Agri Tech 2000

Topic_____

Rapporteurs
Name _____
School _____

Anticipated Student Learning Outcomes from High School Implementation:
(knowledge, skills and attitudes)

Opportunities for Scientific Investigation and Problems Solving:
(problems addressed, experiments, investigation and other opportunities to develop problem solving, critical thinking and scientific understandings)

Curriculum and Instructional Innovation:
(changes in program as a result of implementation, what's new and different, appeal to students)

Educating the Whole Person:
(leadership, cooperation, citizenship and personal development of students)

Implications for Curriculum Implementation
Agri Tech 2000

Topic_____

Rapporteurs
Name _____
School _____

Integration Skills:

Math
(related concepts, opportunity to affect attitude, opportunity for team teaching)

Science
(related concepts, opportunity to affect attitude, opportunity for team teaching)

Communication Skills
(related concepts, opportunity to affect attitude, opportunity for team teaching)

Technology:
(related concepts, opportunity to affect attitude, opportunity for team teaching)

Instructional Facilities and Materials:
(school laboratory facilities, community resources and specialized equipment not traditionally part of the agricultural program)

Implications for Curriculum Implementation
Agri Tech 2000

Topic_____

Rapporteurs
Name _____
School _____

Student Careers:
(careers related to instruction after high school and college graduation)

High School

College

Related Educational Issues:
(Interesting Current Events)

Implications for Electronic and other Educational Technology:
(types of technologies needed to teach, opportunities for networking between schools, changes that are occurring)

Problems and Concerns for Implications in Your School:

APPENDIX E

SUMMARY AND REFLECTIONS OF ATP TEACHER DEVELOPMENT PROGRAM RESULTS

Implications for Curriculum Implementation
Agri Tech 2000

Topic: AQUATIC ECOLOGY AND WATER POLLUTION

Listening Team:

Keith Schiebel:	Vernon Verona Sherrill Senior High School
Donna Moore:	Lowville Central School
William Ransom:	Greenville Jr./Sr. High School
Diane Jobe:	Cornell University

Description of Session:
(overview and major areas addressed)

1. Aquatic ecology.
2. Water pollution.
3. Water quality.
4. Benthic invertebrates and plants.
5. Phytoplankton and zoo plankton.

Summary of Instructional Events and Activities:
(learning activities – group and individual)

1. Hydrographic mapping of a pond.
2. Water sampling including temperature, depth, sodium content, chloride content, pH, total dissolved solids, dissolved oxygen, ammonia and sulfides.
3. Fish sampling including size and number, stomach contents and scale size and age.

Anticipated Student Learning Outcomes from High School Implementation:
(knowledge, skills and attitudes)

1. Knowledge of scientific terms such as dissolved oxygen, ammonia, hydrogen sulfide, etc.
2. Use of science equipment such as microscope, water test, VCR equipment.
3. Taking samples such as water and soil.
4. Understanding the ecological systems in relation to man.
5. Understanding participation in math, percent, volume ratio proportions, identification.
6. Mapping and grafting.

Opportunities for Scientific Investigation and Problems Solving:
(problems addressed, experiments, investigation and other opportunities to develop problem solving, critical thinking and scientific understandings)

1. Teach students how to take a sample.
2. Experimentation.
3. Collecting data.
4. Analyze data.
5. Hypothesis.
6. Conclusion.

Curriculum and Instructional Innovation:
(changes in program as a result of implementation, what's new and different, appeal to students)

1. Hands on outside the classroom.
2. Whole new environment.
3. Organization skills.
4. Students will be able to come to their own conclusion with the right direction.

Educating the Whole Person:
(leadership, cooperation, citizenship and personal development of students)

1. Student/ or level of awareness.
2. Working with others to accomplish a task.
3. Ability to share and work together.
4. Making decisions by a cooperative method.

Integration Skills:

Math
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Measuring and ratios.
2. Graphing.
3. Area.
4. Statistics (means, averages).
5. Counting and percentages.

Science
(related concepts, opportunity to affect attitude, opportunity for team teaching.)

1. Charting
2. Mapping.
3. pH.
4. Temperature.
5. Testing.
6. Using microscope.
7. Aquaculture.
8. Water quality.
9. Food chain.
10. Identification of microbes.
11. Habitat.
12. Carrying capacity.
13. Sampling.
14. Boating skills.
15. Compass.
16. Identification of live and dead things.
17. Growth patterns.
18. Toxicity.
19. Rotifers!

Communication Skills
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Team work (in mapping, sampling).
2. Group reports.
3. Read and follow directions.

Technology
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Use of tools and adaption.
2. Aquatic management.

Instructional Facilities and Materials:
(school laboratory facilities, community resources and specialized equipment not traditionally part of the agricultural program)

1. Pond.
2. Boat.
3. Net.
4. Waiters.
5. Fish.
6. Microfiche.
7. Test kits.
8. Microscope.
9. Buckets.
10. Compass.
11. Screen mesh.
12. Syringe.
13. Post hole diggers.
14. MS222.
15. Alidade.
16. Measuring tape.
17. Rope.
18. Graph paper.
19. Thermometers.
20. Rotifers.

Student Careers:
(careers related to instruction after high school and college graduation)

High School

1. Technician at fish hatchery.
2. Water tester.
3. Owner of fish pond.
4. Research assistant.

College

1. Wildlife biologist.
2. Teacher.
3. Researcher.
4. Marine biologist.

Related Educational Issues:
(Interesting Current Events)

1. Zebra mussels.
2. Erosion of sea shores.
3. Pollution of oceans/fresh water.
4. International regulations.

Implications for Electronic and other Educational Technology:
(types of technologies needed to teach, opportunities for networking between schools, changes that are occurring)

1. CDROM.
2. Electrical testing equipment.
3. Microscope with VCR camera.
4. Electric shocker to count fish.
5. Laser discs with VCR.
6. Boat.

Problems and Concerns for Implementation in Your School:

1. Cost of equipment.
2. Location of ponds.
3. Transportation.
4. Liability.
5. Length of time to conduct activities.

Implications for Curriculum Implementation
Agri Tech 2000

Topic: RECOVERY AND RECYCLING

Listening Team: Marty Krause: Pioneer High School
Sue Krause: Friendship
Terry Ramsey: Cazenovia Jr./Sr. High School
Diane Jobe: Cornell University

Description of Session:
(overview and major areas addressed)

1. Waste water treatment.
2. Solid waste disposal.
3. Hazardous waste disposal.

Summary of Instructional Events and Activities:
(learning activities – group and individual)

1. Wastewater demonstration project.
2. Which micros are here? (Soda bottle).
3. Demonstrate BOD by using a sample of activated sludge.
4. Setting speed of various size particles.
5. Tour a wastewater treatment plant.
6. Compost lab activity.
7. "Light My Fire"
8. "Potential hazards in your home.

General Comments: Students should understand the importance of wastewater management. Need more hands-on activities!

Anticipated Student Learning Outcomes from High School Implementation:
(knowledge, skills and attitudes)

1. Understand the importance of waste management.
2. Understand action of micro organisms producing bio-solids.
3. Understand difference between non-hazardous and hazardous wastes.
4. Appreciation for maintaining a healthy environment.
5. Understanding new technologies in waste management--fewer landfills for more waste.

Opportunities for Scientific Investigation and Problems Solving:
(problems addressed, experiments, investigation and other opportunities to develop problem solving, critical thinking and scientific understandings)

1. Determine what to do with the tons of solid waste produced each day.
2. How to keep the many gallons of wastewater from polluting our water system.
3. How to safely dispose of hazardous waste.
4. How to efficiently decompose solid waste.

Curriculum and Instructional Innovation:
(changes in program as a result of implementation, what's new and different, appeal to students)

1. More hands on and less lecture.
2. Field trips of local facilities.
3. Demonstration to define wastewater.
4. Career awareness in waste management.

Educating the Whole Person:
(leadership, cooperation, citizenship and personal development of students)

1. Educating the nonagricultural student and community.
2. Recycling in the school.
3. BOAC and other FFA activities.

Integration Skills:

Math
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Ratio C:N.
2. Composting:
3. Percent moisture.
4. Volumes, measurement.
5. Conversions from Centigrade to Fahrenheit.
6. Team teach with math teacher.

Science
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Definitions.
2. Ciliates.
3. Compost.
4. Use of microscope.
5. Measurement.
6. Elements table.
7. pH scale.
8. Time vs. temperature.
9. Rotifers.
10. Science team teaching.

Communication Skills
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Public awareness through FFA and class, group projects, and bulletin boards.
2. Students involved in development of all of above.
3. Students develop their own questions and question-answers.
4. Journal writing.
5. Settling projects.

Technology
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Team teach with English teacher.
2. Design and draw a recycling plant include specifications then construct plant using puc, wood, and styrofoam sheets.
3. Team teach with agriculture or math or technology teacher.

Instructional Facilities and Materials:
(school laboratory facilities, community resources and specialized equipment not traditionally part of the agricultural program)

1. Samples from cafe (dirt, water).
2. Trip to milk plant, brewery, municipality.

Student Careers:
(careers related to instruction after high school and college graduation)

High School

1. Labor.
2. Transportation.
3. Construction.
4. Marketing.
5. Municipalities such as Public Works Dept..
6. State, Town, County.
7. Parks/Recreation.
8. Landfills.
9. Truck Driver

College

1. Law-Regulations.
2. ASHA.
3. Engineering/design.
4. Marketing.
5. Research and Industry.
6. Food.
7. Analysis.
8. Management.
9. Instruction.

Related Educational Issues:
(Interesting Current Events)

1. Legislature.
2. Town ordinances.
3. Purification.
4. Nuclear Waste Sites.

5. New Water Sewage Treatment plant in community.

Implications for Electronic and other Educational Technology:
(types of technologies needed to teach, opportunities for networking between schools, changes that are occurring)

1. Distance learning.
2. CDROM,.
3. Modems.
4. VCR camera-microscope adapter.
5. VCR tapes.
6. Seminars/workshops.
7. Computer software.

Problems and Concerns for Implimentation in Your School:

1. Community education-parents, industry, etc., Youth organization, 4H/FFA/FBLA.
2. Way of life, ongoing process.
3. Involvement-take ownership.
4. Money, odor, location, and time factors.

Implications for Curriculum Implementation
Agri Tech 2000

Topic: INTEGRATED PEST MANAGEMENT

Listening Team:

Beth Spencer:	Tri-Valley High School
Sue Krause:	Friendship Central School
George McCabe:	Putnam-Westchester BOCES
Diane Jobe:	Cornell University

Summary of Instructional Events and Activities:
(learning activities – group and individual)

1. Video.
2. Coin toss/ Pest problem or not a problem control or do not control. Estimate economic loss.
3. Bean Game: Licorice bias example.
4. Telecommunication with CNET.
5. Video disc player.
6. Sequential sampling.
7. Predicting biological events with degree days.

Anticipated Student Learning Outcomes from High School Implementation:
(knowledge, skills and attitudes)

1. To optimize pest control in relation to the total plant production system in the light of economic, social and environmental conditions.
2. Ability to operate CNET or a networking system.
3. Ability to identify agronomically important pests.

Opportunities for Scientific Investigation and Problems Solving:
(problems addressed, experiments, investigation and other opportunities to develop problem solving, critical thinking and scientific understandings)

1. Decision grid making process-probability to treat or not to treat (treatment vs. no treatment)
2. Predicting biological events with growing days.
3. Pest identification, life history and insect ecology.
4. Collect and identify agronomically important notes.

Curriculum and Instructional Innovation:
(changes in program as a result of implementation, what's new and different, appeal to students)

1. Application of math principles with games.
2. Cooperative learning activities.
3. Team teaching.
4. Collect and identify agronomically important pest.

Educating the Whole Person:
(leadership, cooperation, citizenship and personal development of students)

1. Awareness of environmental, economic, social concerns with IPM.
2. Sprayer calibration workshops.
3. Demonstration plots with cooperative extension or local agricultural businesses.
4. Radio spot on growing degree days.
5. Host a pesticide application training course.
6. IPM promotion at local and state fair.

Integration Skills:

Math
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Probability.
2. Percentages.
3. Economic factors.
4. Accumulated frequencies.
5. Algebra.
6. Self evident plotting and graphing.
7. Decision making based on data.

General comments: Math can be fun.

Science
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Plant and Pest Identification.
2. Insect.
3. Predicting biological events with degree days.
4. Sampling.
5. Monitoring.

Communication Skills
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Awareness.
2. Read reports.
3. Make reports.
4. Opportunity to discuss.
5. Accumulating data.

Technology
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Use of computer to update information i.e.: CNET, networking in general.
2. Use of laser disks.
3. Vast knowledge base.

Instructional Facilities and Materials:
(school laboratory facilities, community resources and specialized equipment not traditionally part of the agricultural program)

1. Land laboratories to conduct pest collections.
2. Conduct monitoring activities.
3. Lab facilities, microscopes, etc.
4. Good opportunities to work with local businesses. i.e. Tree firms, farms, chemical company (new concept). Not yet totally broad based in industry.

Student Careers:
(careers related to instruction after high school and college graduation)

High School

1. Research Aide.
2. Summer Intern.

College

1. Field Researcher.
2. IPM Specialist.
3. Agricultural Producer.
4. EPA Specialist.
5. Educational trainer/teacher.
6. Extension agent.
7. Agricultural product broker, .

Related Educational Issues:
(Interesting Current Events)

1. Alar.
2. Waste management.
3. Water quality.
4. Food safety.
5. Environmental issues.
6. Food quality and quantity.

Implications for Electronic and other Educational Technology:
(types of technologies needed to teach, opportunities for networking between schools, changes that are occurring)

1. Video disc and CNET definitely enhance instruction.

Problems and Concerns for Implementation in Your School:

1. High cost of above items and inservice for adaptation into curriculum.

Implications for Curriculum Implementation
Agri Tech 2000

Topic: **ENVIRONMENTAL MANAGEMENT**

Listening Team:

John Dlugos:	Coopers Educational Center
Ben Conte:	St. Johnsville Central School
Than Mehlenbacher:	Fillmore Central School
Irene Snow:	Putnam-Westchester BOCES
Diane Jobe:	Cornell University

Description of Session:
(overview and major areas addressed)

1. Forestry.
2. Wildlife management.
3. Grassland management.
4. Environmental hazards/natural disasters.

Summary of Instructional Events and Activities:
(learning activities – group and individual)

1. Environmental Hazards.
   a. Discussion on the uncertainty of nature.
   b. Research events or disasters that have had a large impact on populations.
   c. Video.

2. Forestry.
   a. Pretest, introductory video.
   b. Forest inventory activity.
   c. Video.

3. Wildlife.
   a. Introductory video:word association, "Make the connections" activity.
   b. "How many bears live in this forest"
   c. "Oh Deer" video.

4. Grassland management.
   a. No activities.

Anticipated Student Learning Outcomes from High School Implementation:
(knowledge, skills and attitudes)

1. Forest Management.
   a. Understand the importance of forests to the state, to the nation and to the world.
   b. Be able to discuss the important interrelationships among trees, wildlife, and water resources.
   c. Be able to inventory forest resources using sampling and math techniques.
   d. Forestry is math, science, hard work and dedication.

2. Wildlife Management.
   a. Understand the historical impact of man on previous wildlife populations.
   b. Be able to explain the four basic elements of habitat.
   c. Be able to explain the concept of carrying capacity as it relates to wildlife.
   d. Be able to illustrate many of the interacting factors that encompass conservation and wildlife management.

General Comments: Students usually equate wildlife management to hunting and fishing but through this module they will realize that in addition to hunting and fishing, wildlife management includes good habitat and well-managed habitat for game and non-game species.

3. Grasslands.
   a. Understand the distribution of grasslands and locations throughout the world.
   b. Be able to discuss the elements that make up a grassland and its origin.
   c. Understand the make-up of wildlife within the grassland ecosystem.
   d. Be able to discuss the impact of many on the reduction of area of true grassland.

General Comments: Most students equate grassland to pasture and hayfields but through this module they discover that grasslands are ecological happenings which existed long before agricultural practices.

4. Environmental hazards/natural disasters.
   a. Review concepts from Earth Science relating to major earthquakes and volcanic regions of the world.
   b. Understand the global impact of natural disasters on human populations.
   c. Be able to discuss the importance of early warming and prediction of natural disasters to large population centers.
   d. Be able to appreciate the probable dangers that man risks for the sake of development.

Opportunities for Scientific Investigation and Problems Solving:
(problems addressed, experiments, investigation and other opportunities to develop problem solving, critical thinking and scientific understandings)

1. Artificial regeneration.
2. Basal area.
3. Biodiversity.
4. Forest inventory.
5. Forestry regulation.
6. Site preparation.
7. Natural regeneration.
8. Carrying capacity.
9. Ecological succession.
10. Identification of tree species.
11. Endangered species.
12. Habitat.
13. Desert grassland.
14. Tame grassland.
15. Mixed prairie.
16. Earthquakes, volcanoes, landslides, floods, hurricanes and tornadoes.
17. Math-calculation: board feet, density, volume.
18. Solar profile and testing.
19. Estimation of cost.

Curriculum and Instructional Innovation:
(changes in program as a result of implementation, what's new and different, appeal to students)

1. Change in program.
2. Time.
3. Additional class, new class.
4. New and different.
5. Working outdoors.
6. Resources.
7. Group work-cooperative learning.
8. Working closely with forestry regulators such as the conservation office.

General Comments: The appeal to students will rise in proportion to the hands on activities.

Educating the Whole Person:
(leadership, cooperation, citizenship and personal development of students)

1. Awareness in self and then communicate to the family.
2. This will be passed to the community.
3. Working in teams.
4. Appreciation and understanding for the ecosystem and for resources including time.
5. Awareness of these issues.

Integration Skills:

Math
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Pie R-Squared.
2. Determination of square root, ratios, and averages.

3. Linear measurement.
4. Finding area and circumference of a circle.
5. Square feet per acre.
6. Conversions from and to the metric system.
7. Determining board feet.
8. Interpolation.
9. Determining tree volume according to tapes.

Science
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Artificial regeneration/natural regeneration.
2. Carrying capacity.
3. Basal area.
4. Identification of plants and animals.
5. Ecological succession.
6. Endangered species.
7. Habitat.
8. Limiting factors.
9. Biodiversity.
10. Renewable resources.
11. Environment including growing, top organisms, climate, soils.

Communication Skills
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Public awareness-FFA and class projects.
2. Research skills.
3. Group projects and team work.
4. Problem solving.
5. Notebook.
6. Reading and following directions.

7. Commercial products.

8. Wildlife preservation.

9. Debate/role playing.

Technology
(related concepts, opportunity to affect attitude, opportunity for team teaching)

1. Computer modeling for forestry.

2. Harvesting methods and strategies.

3. Reforesting techniques.

4. Research.

5. GIS system field trips.

6. Wildlife museum.

7. Forest, wood production.

Instructional Facilities and Materials:
(school laboratory facilities, community resources and specialized equipment not traditionally part of the agricultural program)

1. Cruising sticks and diameter tapes.

2. 100 foot tape measuring feet 10th and 100ths of feet.

3. Raised relief map.

4. Stereo scope.

5. Videos i.e. natural disasters and wild life.

6. Small woodlot with trees at least 10 inches dbh.

7. Core sampler/ increment bores.

8. Topographical map.

9. County soil survey.

Student Careers:
(careers related to instruction after high school and college graduation)

High School

1. Forester.

2. Topographical leveling.

3. Firewood cutting or chainsaw mechanic and operator.
4. Trail makers.
5. Bulldozer operator.
6. Lumber grader or sawyer or logger.

College

1. Surveying.
2. Wildlife biologist.
3. Silvaculture-tree planter, forester.
4. Agriculturalist.
5. Soil scientist.
6. Forest ranger.
7. Fire fighter.
8. Geologist.
9. meteorologist.
10. Seismologist.
11. Archaeologist.
12. Game warden.

Related Educational Issues:
(Interesting Current Events)

1. Extinction of species.
2. Math.
3. Management.
4. Clear cutting.
5. Spotted owl.
6. Snail darter.
7. Government: recreational use vs. forever wild, private enterprise vs. government control,

Implications for Electronic and other Educational Technology:
(types of technologies needed to teach, opportunities for networking between schools, changes that are occurring)

1. Electronic linkups: Water quality comparison across the state, computer networking.
2. Laser disks--what is available?
3. CD ROM-What is available?
4. Test sites.

Problems and Concerns for Implementation in Your School:

1. Money.
2. Classroom that is clean.
3. Level of students.
4. Stepping on other teacher's toes.
5. Finding teachers to share responsibility.

APPENDIX F

STRONG INTEREST INVENTORY EVALUATION

Implications for Curriculum Implementation
Agri Tech 2000

Topic: **STRONG INTEREST INVENTORY SURVEY EVALUATION**

Listening Team:

Mary Lou Genaway:	Pioneer Central School
Ray Lighthall:	Stockbridge Valley Central School
Felicia Harada:	John Bowne High School

Administration:

1. Recommend a random sample for the tenth grade survey of occupational options and interests.

2. For guidance purposes individual assessment is desirable.

Uses:

1. To initiate and support a Career Orientation program in each academic discipline throughout the school and in cooperation in the Introduction to Occupations course.

2. To aid in career planning.

3. To aid in post secondary choices, especially college opportunities.

4. To bolster individual psychological counseling measures of self-esteem, life options and expanding the world of work.

5. Inform parents on how to help their children in course and career planning.

6. Aid the business and professional community in building networks to the school.

APPENDIX G

WEEK IN REVIEW

Integrating Science and Agriculture Through Agri-Tech Prep 2000

WEEK IN REVIEW

Summary Program Evaluation
(Percent Responses)

Hands on Science-Presentations by Participants:
8:30-11:00

Please rate the following:

n=10	(1) very poor	(2) poor	(3) average	(4) good	(5) very good	$\bar{x}$
teacher presentation	0	0	0	40	60	4.6
clarity of content	0	0	10	40	50	4.4
appropriateness to high school students	0	0	0	40	60	4.6

NOTE: The mean score was calculated on a scale from 1 to 5; lowest=1, (most far left), highest=5.

Comments:

1. The idea of having presentations was good. I think teacher's personally felt pressured to present information without ample opportunity to digest the material and prepare for their presentations.

2. The presentations were good, but repetitious. I sat near people not directly associated with the week. They were doing other things than listening. Who were we really doing the presentations for?

Panel Discussion:
11:00-12:00

n=10

	Percent Responses					
	not at all	little	some	very	extremely	$\bar{x}$
How well were your questions answered during the Friday program?	0	0	25	67	8	4.6
Do you feel there was enough time allotted?	0	17	17	42	25	4.5

NOTE: The mean score was calculated on a scale from 1 to 5; lowest=1, (most far left), highest=5.

What other questions do you still have regarding ATP 2000?

1. I would like to thank the steering committee for all of the hard work and leadership that they have exhibited over the past year.
2. These questions will have to be answered in communication with other teachers in home school and when I try to teach.
3. Funding for non-pilot schools and for after pilot program--continuation.
4. How are we going to keep it going?

GENERAL PROGRAM EVALUATION

n=12

Presentations:

	Percent Responses					
	poor	average		excellent		
	1	2	3	4	5	*x*
Was the program stimulating?	0	0	0	33	67	4.7
Was it well organized?	0	0	0	50	50	4.5
Was the time used efficiently?	0	0	0	50	50	4.5
Was there ample opportunity for interaction?	0	0	8	17	75	4.7
Did it meet your needs as a participant?	0	0	0	50	50	4.5

Workshop staff:

	poor	average		excellent		
	1	2	3	4	5	*x*
Was the workshop staff knowledgeable?	0	0	0	8	92	4.9
Was the workshop staff helpful?	0	0	0	8	92	4.9
Was the workshop staff friendly?	0	0	0	0	100	5

Accommodations and Facilities:

	poor	average		excellent		
	1	2	3	4	5	*x*
Were the accommodations and facilities satisfactory?	0	0	0	33	67	4.7

NOTE: The mean score was calculated on a scale from 1 to 5; lowest=1, (most far left), highest=5.

What was the most useful part of the program to you?

1. Developed programs with activities that can be plugged right into my program.
2. Material presented.
3. Jim Van Riper.
4. Exchanges with the other teachers and staff.
5. Teacher readiness of the outlines.
6. The techniques or outline used in the area of pest management. We should use his procedure and concepts for other teaching materials and curriculum development.
7. Learning about the educational materials.
8. Learning about the new SED regulations and variances.
9. Inservice and materials.
10. Excellent program!!!
11. IPM workshop and waste management workshop.
12. Workshops with well organized handouts.
13. It seems the more we talk the more the program is coming together.
14. Hands on activities.

What was the least useful part of the program?

1. So much seat time when we are trying to move away from this approach in our teaching style.
2. Friday morning's presentations.
3. None.
4. Friday evaluations.

Suggestions for future educational events for ATP 2000.

1. Keep the inservice going.
2. Get to others in education--more advocates.
3. I feel that we could learn mastery of one area in a whole lot of different subjects with less time spent per subject or more speakers instead of in depth on one area and one speaker per day.
4. Less seat time, more hands on activities.
5. More teacher friendly outlines and activities.
6. Bring in math and English, etc. to help bring in more ideas from their perspective.
7. Involve superintendents (We are doing a great job so far!)
8. Time for questions/answers/concerns.

Other comments:

1. I feel very positive about this week.
2. It was an excellent week and I am proud to be a part of the movement for directing the future of Agriculture Education in our state.
3. Great week! Thanks!